OnLIMS Technical Specifications

Reference sheet — architecture, instrument interfaces, sizing and licensing

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System architecture and platform

Deployment model

Architecture	Client-server; applications run from a shared folder with workstation prerequisites
Workstation install	Applications run from a shared folder through a Windows shortcut. Workstations require compatible ODBC drivers, .NET runtimes, supplied dependencies and permissions for the installed release.
Network protocol	TCP/IP over LAN or WAN
Server environment	Windows Server: on-premises, virtualised or private cloud, including the customer's own Azure
Remote access	Citrix Virtual Apps and Microsoft RDS, set up against the installed release, drivers and instrument connections of each deployment

Database tier

Engine	Microsoft SQL Server. Version, edition, compatibility level, capacity and authentication are agreed with the customer’s SQL administrator for the installed release.
Connectivity	ODBC for native modules; .NET SQL Server data layer for managed modules
Data integrity	SQL Server stores jobs, samples, worksheets and QC records, with stored procedures and views doing part of the data processing. Recovery model, backups and restore tests are managed by the SQL administrator.
Audit trail	Application events and result-change auditing: recorded result changes include previous value, new value, user and time, reviewed per job in the OnLAB Audit Viewer and exportable to Excel.
Multi-database	Native applications can select among the configured database connections.

Execution engine

Core runtime	Native C++ core with a C#/.NET application layer (DevExpress)
Processing model	Multi-threaded, deterministic execution
Calculations	Result and @ calculation columns are calculated on the worksheet; calculated cells retain their formulas and recalculate when a reading changes.

Modules

The desktop modules use Microsoft SQL Server and shared application files, with the prerequisites of each installed module. Management modules are licensed per site with unlimited users; instrument modules are licensed per connected instrument, and manual entry is included in the site licence.

OnLAB	Register batch or routine jobs, samples, tests and units; review result states and range flags, publish results, preview certificates and export published values to CSV or Excel.
OnWSH	Electronic worksheet with sample and QC rows, preparation values, instrument working readings and result formulas. File imports place each reading in the row of its sample and the column of its element and unit.
OnQC	Reference-material records and Shewhart, X-Control and CUSUM charts. At result locking, OnWSH checks standards, blanks and duplicates against their record limits and opens the Control Chart for any value outside them; the analyst cancels and repeats, or accepts with a written note. OnLQC adds duplicate precision and range controls.
LabData	Client application for following samples, viewing published results and preparing analysis requests. Visible clients and tests follow each account's access; values not yet released stay masked.
OnConfig	Application settings, users, roles, clients, instruments, reference data and audit/error logs, with roles from Administrator to Client and a permission matrix for actions such as publishing results.
OnQMS	Accreditation evidence for **two standards**: ISO/IEC 17025 for laboratories and ISO/IEC 17020 for inspection bodies, each with its own clause-by-clause cockpit and drill-down to the real records. Proficiency-testing control charts, daily quality control, method validation, sampling plans, environmental logs, sieve and screen checks, competence, calibration, risks, retention and disposition, internal audits and CAPA. Ten accreditation packs citing the local guideline by version, and an optional local AI assistant whose data never leaves your network. Fully bilingual EN/ES — see the full module catalogue

OnSight	Laboratory dashboard for the lab's TVs and supervisors' monitors: open work per group, turnaround against target, shift output, exceptions, Levey-Jennings and SPC control charts with Westgard rules, and plant routines. Read-only and served to any browser on the lab network — see OnSight requirements

OnQMS module catalogue

OnQMS ships as one application with a pack per standard: ISO/IEC 17025 for laboratories and ISO/IEC 17020 for inspection bodies. A site accredited for only one of them sees only that menu — a body that does only inspection has no method validation or proficiency testing, and its analytical group becomes *Sampling*. A laboratory that also inspects gets both clause trees over one shared core: documents, competence, equipment, internal audits, management review, nonconformities and the audit trail are the same records serving both standards.

The full catalogue, in menu order — 54 modules across 10 workflow groups:

Home	Dashboard · OnQMS Map · Test Readiness (laboratories only) · ISO 17025 Coverage · ISO 17020 Coverage (both standards) · Alerts & Due Dates
Accreditation	Accreditation Scope · Accreditation Status
Document Control	Documents · Records Retention · Records Disposition
Personnel & Competence	Training Records · Compliance Radar · Owners by Test · Personnel Competence
Equipment & Suppliers	Equipment Calibration · Instrument Lookup · Equipment by Test · Suppliers · Environmental Conditions · Sieves and Screen Checks · Intermediate Checks
Methods & Analytical Quality	Method Validation (laboratories only) · Quality Control (laboratories only) · Annual PT Programme (laboratories only) · Proficiency Testing (PT) (laboratories only) · PT control chart (z-scores) (laboratories only) · Sampling Plans
Inspection (ISO/IEC 17020)	ISO 17020 Coverage (both standards) · Requests (inspection bodies only) · Inspections (inspection bodies only) · Scheduling (inspection bodies only) · Inspection Clients (inspection bodies only) · Inspection Schemes (inspection bodies only) · Inspector Monitoring (inspection bodies only) · Inspector Workload (inspection bodies only) · Appeals (inspection bodies only)
Improvement & Governance	Non-Conformances / CAPA · Complaints · Risks & Opportunities · Impartiality & Confidentiality · Impartiality Matrix · Internal Audits · Management Review · System Log (audit trail)
Reports	Readiness Summary (PDF) · Quality Reports
Configuration	OnQMS Settings · Laboratory Sites · AI Settings (Assistant) · Email notices · Roles & Permissions · Setup & Onboarding · Setup Manual

Cross-cutting, on every module: role-based permissions, an append-only system log, electronic signatures, per-site scoping, e-mail notices for due dates, PDF reports, and a fully bilingual English/Spanish interface.

Instrument interfaces (Level 0)

Physical connectivity

Serial	RS-232 and RS-485, directly or through hardware converters and Moxa device servers
Network	TCP/IP and UDP sockets
File-based	Watched folders (polling) for CSV, TXT, XML and proprietary instrument export formats
Coverage	150+ instruments from about 40 brands in the connection catalogue. Each connection is set up for the specific model and checked against an export with known values.
Bidirectional operation	Supported on many instruments: OnLIMS writes a text file with the sample IDs for the run — and, where the instrument needs it, the sample weights, as with ICP — the instrument software reads it, and OnLIMS then captures the instrument's own output file. Which instruments accept a sequence file depends on their control software — send us your instrument list and we will confirm yours

What we can connect

Instrument connection work starts with the model, communication settings and an unmodified export containing known values. OnLIMS support supplies or validates the reader, and sample identities, columns, units and saved readings are checked together with the laboratory before routine use.

Already integrated	150+ instruments from about 40 brands, connected by serial, network or file import
Instrument classes in production	Atomic absorption, ICP-OES and ICP-MS, XRF and XRD, carbon/sulfur and mercury analysers, titrators, UV-Vis, fire assay balances with auto-tare, and analytical balances
Examples of makes in service	Agilent, Shimadzu, Thermo, PerkinElmer, Spectro, Malvern Panalytical, Bruker, Rigaku, LECO, Mettler Toledo, Sartorius and Ohaus, among others — the list is not a limit
Not on the list?	Send us your instrument list and we will tell you what we read today and what would need a parser

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OnSight requirements

OnSight does not run from the shared folder like the desktop applications: it runs as a Windows service on a laboratory server and serves its screens over the internal network, reading the same OnLIMS database with its own read-only account. What OnSight shows →

Server	Windows x64 on the laboratory network — the OnLIMS server or a mini PC next to the TV. One signed installer, running as a Windows service under its own service account
Database access	A read-only SQL account on the OnLIMS database (script provided); on top of it, an in-application filter refuses any statement that is not a read. Optional encrypted (TLS) connection to SQL Server
Network	One free TCP port on the server (8080 by default) reachable from the TVs and PCs; optional HTTPS. No Internet connection required
Screens	Any TV or PC with a Chromium-based browser (Chrome 80 or later, Edge), 1080p or 4K. No login on the TVs, no limit on screens or viewers
Editing	The existing OnLIMS supervisor login
Data rule	Only published results count: a sample is done when all its results are published, at the time of the last one

Licensing model

Management applications	OnLAB, LabData and OnConfig are licensed **per site, with no restriction on the number of users**
Instrument applications	OnWSH and OnQC are licensed **per instrument**, whatever the instrument is. A laboratory with two balances, one LECO and two AA needs five OnWSH licences; if the LECO is later replaced by an XRF it is still five. Chemists may run OnWSH and OnQC on any machine in the laboratory without additional licences
Support and maintenance	The first year after installation is included. After that, an annual agreement at 18% of the total licence cost covers software updates, instrument drivers and parsers, and small fixes. Enhancements are quoted before any work starts

Deployment footprint

The shared application folder holds applications and supplied components. Administrators manage Windows share and filesystem permissions and include database backups, external report/parser resources and workstation dependencies in the recovery plan.

Bin (read/execute)	Applications, DLLs and INI files
`Help`	Help files and general documentation

`Inst`	Instrument data: drivers and instrument files
`RepoForm`	Configuration scripts for Certificate of Analysis forms
`Sql`	Optional backup destination; the SQL administrator schedules and verifies backups under the recovery plan.
`Sent`	Default LIMS export folder
`Temp`	Temporary data written by the applications

Job types and exports

Batch jobs	A fixed number of samples, the usual shape of a geology job with drill core
Routine jobs	A routine is created once and continues collecting samples through OnWSH. By default each sample is identified by routine name, date and time. Minimum, maximum and standard deviation are set per test in OnLAB.
Sample login	Create samples in OnLAB or load job samples into an OnWSH template; each worksheet row keeps its Sample ID and job link and is matched to the instrument's sample identifier on import.
Export formats	OnLAB Job Export: CSV, XLSX and XLS, with values only for published results. OnWSH also exports worksheet CSV and saves/loads worksheet XML. Custom integration scope is agreed with the laboratory.
Labels and certificates	Labels print from OnWSH, OnLAB and LabData; label layout and Certificate of Analysis formats are configured through INI files

Data processing and calculation engine

Engine	Worksheet formulas calculate result and @ calculation columns. Excel is needed only where the laboratory's reporting workflow uses it.
Formulas	User-configurable algebraic equations referencing sample, dilution, moisture, tare, gross and CRM values
Unit conversion	Defined by the template formula with its source and destination units; for example, mg/kg to % divides by 10000.
Detection limits	Each result column carries a detection limit: a calculated value below it is shown as the limit while the calculated value is retained (with a 0.10 limit, 0.05 is shown as 0.10). Lower and upper limits provide range flags.
Significant figures	Per-column Format: decimal places, significant figures or rules by range. The worksheet saves the rounded value.
Dilution factors	The worksheet formula combines reading, volume, dilution and sample weight: 25 mg/L, 50 mL, dilution 1 and 1.0000 g give 0.125% Cu. A dilution can also be applied when a reading is selected.

Security, access control and compliance

Authentication	Separate Windows file access, SQL Server authentication (Windows integrated or SQL login), and a registered OnLIMS application user with the configured login policy.
Authorisation	Role-based access control with fine-grained permissions: read-only, result entry, worksheet creation, QC validation, final release
Result lifecycle	Worksheet results are locked, the worksheet is approved (read-only) and exported to OnLAB. Publishing and unpublishing require permissions and passwords, and result changes are recorded in the audit.
ISO/IEC 17025	Built-in controls that support ISO/IEC 17025 workflows: document control, traceability, reagent tracking, instrument calibration schedules and audit logging. Accreditation is granted to the laboratory, not to the software
21 CFR Part 11	Controls that support Part 11 workflows: user-attributable electronic sign-off, system logs and audit records. Part 11 compliance is assessed on the validated system as deployed, not on the software alone

Sizing, network and environment

Database growth	Sizing reference: about 0.5 MB per 1,000 results, including audit data, measured across databases with 13 and 14 years of history and 26 and 187 results per sample.

Growth per year	Depends on how many results the laboratory produces, not on how many samples it receives. Measured: **1.5 GB per year** in a laboratory producing about 3.2 million results a year, and **4.1 GB per year** in one producing about 7.3 million
Transaction log	Size separately from the data file according to the recovery model, workload and backup schedule.
Latency — direct client	Under 10 ms recommended
Latency — remote	Planning reference: approximately 150 ms through Citrix or Microsoft RDS
Bandwidth	Low footprint during active sessions thanks to optimised SQL execution
Instrument workstations	One PC per connected instrument, each with an available COM port for serial instruments

Frequently asked questions

Which versions of Microsoft SQL Server does OnLIMS support?

OnLIMS runs on Microsoft SQL Server. The version, edition and compatibility level for the installed release are agreed with your SQL administrator, together with capacity, authentication and the ODBC driver.

Does OnLIMS need to be installed on each workstation?

Applications run from a shared folder through a Windows shortcut. Each workstation needs the required ODBC driver, runtimes, dependencies and permissions for its installed modules.

How much database storage does a laboratory need?

About 0.5 MB per 1,000 results including audit data. Measured examples: 1.5 GB per year in a laboratory producing about 3.2 million results a year, and 4.1 GB per year in one producing about 7.3 million. The transaction log is sized separately for the recovery model, workload and backup schedule.

How much network latency does OnLIMS tolerate?

Under 10 ms is recommended for a direct client, and the planning reference is approximately 150 ms through Citrix or Microsoft RDS.

How does OnLIMS connect to laboratory instruments?

Through serial (RS-232/RS-485) or network connections and instrument file readers, across 150+ instruments in the connection catalogue. Each reading is imported into the OnWSH worksheet with its sample, element and unit, and reviewed before the results are calculated.

> The current version of this sheet is always at onlims.com/technical-specifications.html
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